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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/371,972	08/10/1999	KONSTANTINE I. IOURCHA	3594-US	9872

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EXAMINER
GOOD JOHNSON, MOTILEWA

ART UNIT	PAPER NUMBER
2672	

DATE MAILED: 12/17/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *10 September 2001* .

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-27* is/are pending in the application.

    4a) Of the above claim(s) *19-22* is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-18 and 23-27* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

        3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14) ☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☒ Notice of References Cited (PTO-892)
16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

18) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
19) ☐ Notice of Informal Patent Application (PTO-152)
20) ☐ Other: .

DETAILED ACTION

1. This action is responsive to the following communications: application, filed on 08/10/1999; IDS, paper #4, filed on 01/3/2000; Preliminary Amendment A, filed on 02/14/2000; Amendment B, filed on 07/23/2001.

2. Claims 1-27 are pending in this application. Claims 1, 8, 9, 13-15, 19, 23 and 27 are independent claims. Claims 1-4, 8-9, 13 and 15 have been amended. Claims 16-27 have been added.

3. The present title of the application is "System and Method for Rasterizing Primitives using Direct Interpolation" (as originally filed).

Election/Restrictions

4. Claims19-22 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected group, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 11.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1, 8, 15 recites the limitation "for each of two points" in claim 1, line 9; claim 8, line 7; claim 15, line 12. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

7.   The following is a quotation of the appropriate paragraphs of 35

U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors

Protection Act of 1999 (AIPA) do not apply to the examination of this application

as the application being examined was not (1) filed on or after November 29,

2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this

application is examined under 35 U.S.C. 102(e) prior to the amendment by the

AIPA (pre-AIPA 35 U.S.C. 102(e)).

8.   Claims 9-13 and 23-27 are rejected under 35 U.S.C. 102(e) as being

anticipated by Baldwin, U.S. Patent Number 6,154,223, "Integrated Graphics

Subsystem with Message-Passing Architecture", class 345/506, 11/28/2000, filed

on 12/09/1998.

As per independent claim 9, "a method of rendering a graphic primitive . .

. method comprising: deriving a channel value of a first point on a first edge of

the graphic primitive; deriving a channel value of a second point . . . ; and based

upon the channel values of the first point and the second point, determining a

channel value for an interior point . . ." Baldwin discloses in col. 9, lines 46-48.

Examiner takes official notice that interpolation is defined as an estimate of values of a function between two known values.

With respect to dependent claim 10, ". . . determining the channel values of the end points of the first edge to determining the channel value of the first point." Baldwin discloses in col. 9, lines 38-39.

With respect to dependent claim 11, ". . . determining the channel values of end points of the second edge to determine the channel value of the second point." Baldwin discloses in col. 9, lines 46-51.

With respect to dependent claim 12, ". . . using depth values of the first point and second point to determine a channel value for the interior point." Baldwin discloses in col. 9, lines 48-49.

As per independent claim 13, it is rejected based upon similar rational as above independent claim 9.

As per independent claim 23, "a method of generating interpolated values for using in rendering a graphic primitive . . . comprising: receiving an independent variable X . . . ; receiving vertex values X0, X1 of a primitive edge having the point . . . represented by the independent variable X; receiving depth values Z0, Z1 associated the vertex values X0,X1; and calculating a ratio value . . ." Baldwin discloses in col. 9, lines 34-51.

With respect to dependent claim 24, ". . . receiving color values associated with the vertex values . . . and calculating interpolated color values for the point based upon the ratio value . . ." Baldwin discloses in col. 9, lines 38-40. Examiner interprets derivatives as the limit of ratio of the change in a function.

With respect to dependent claim 25, ". . . receiving texture values associated with the vertex values . . . and calculating interpolated texture values for the point based upon the ratio value . . ." Baldwin discloses in col. 44, lines 52-67.

With respect to dependent claim 26, ". . . calculating a screen-based Z coordinate for the point based upon the independent variable X, vertex values . . . and depth values . . ." Baldwin discloses in col. 25, lines 53-59.

As per independent claim 27, it is rejected based upon similar rational as above independent claims 23.

Claim Rejections - 35 USC § 103

9.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10.   Claims 1-8 and 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baldwin, U.S. Patent Number 6,154,223.

As per independent claim 1, "in a graphics system . . . graphic primitive having a plurality of sides . . . method comprising: determining a channel value for each of a plurality of vertices of the primitive; Baldwin discloses in col. 9, lines 34-36; selecting an interior point . . . ; determining an interpolated channel value for each of two points . . . and determining a channel value at the selected

interior point by interpolation from the interpolated channel values of the two points." Baldwin discloses in col. 9, lines 34-51.

However, it is noted that Baldwin fails to disclose an interpolated channel value for two interior points. Baldwin discloses in col. 9, lines 34-45, calculating initial values at the start and end points for an edge and interpolating for a unit change. It would have been obvious that once said start and end points are determined that said interior points could be determined by the interpolated values generated to render the triangle. Examiner takes official notice that interpolation is defined as an estimate of values of a function between two known values.

With respect to dependent claim 2, "determining the interpolated channel value for each of the two points step comprises performing linear interpolation using an interpolation engine . . . and using an interpolation engine to determine the channel value of the selected interior point . .." Baldwin discloses in col. 32, lines 21-31, determining color of a triangle by linear interpolation.

However it is noted that Baldwin fails to disclose an interpolation engine. Baldwin's said geometry engine functions to perform said data manipulations and further discloses in col. 4, lines 10-12, a DDA (digital differential analyzer) which is used to produce linear gradation of color or other values. It would have been obvious to one of ordinary skill in the art at the time of the invention that said DDA, which Baldwin discloses as functioning in the geometry engine, col. 4, lines 5-35, produces linear gradation or other data manipulations, and thus performs the functions of an interpolation engine.

With respect to dependent claim 3, "determining the interpolated channel value for each of two points step comprises performing perspective interpolation . . ." Baldwin discloses in col. 45, lines 13-39, texture mapping based upon different filter modes such as nearest and linear.

With respect to dependent claim 4, "repeating each of the steps in claim 1 for a plurality of points in the graphic primitive." Baldwin discloses in col. 9, lines 52-67.

With respect to dependent claim 5, ". . . channel value represents color." Baldwin discloses in col. 49-50.

With respect to dependent claim 6, ". . . channel value represents luminance." Baldwin discloses in col. 9, lines 36-37.

With respect to dependent claim 7, ". . . channel value represents a texture coordinate." Baldwin discloses in col. 42, lines 54-60.

As per independent claim 8, it is rejected based upon similar rational as above independent claim 1.

As per independent claim 14, "a system for rendering a graphic primitive . . . comprising: a plurality of agents configured to receive information . . . ; Baldwin discloses in col. 4, lines 30-35, a host processor; an arbiter coupled to the plurality of agents . . . ; Baldwin discloses in col. 4, lines 41-45; and interpolation engine . . . ; Baldwin discloses in col. 4, lines 31-33, a geometry engine which performs rapid matrix multiplies and related data manipulations; and a router coupled to the interpolation engine . . ." Baldwin discloses in col. 8, line 50, a router.

However it is noted that Baldwin fails to disclose an interpolation engine. Baldwin's said geometry engine functions to perform said data manipulations and further discloses in col. 4, lines 10-12, a DDA (digital differential analyzer) which is used to produce linear gradation of color or other values. It would have been obvious to one of ordinary skill in the art at the time of the invention that said DDA, which Baldwin discloses as functioning in the geometry engine, col. 4, lines 5-35, produces linear gradation or other data manipulations, and thus performs the functions of an interpolation engine.

As per independent claim 15, "a system for rendering a graphic primitive . . . comprising: a channel value input device . . . ; a point specifier . . . ; and interpolation engine . . " Baldwin discloses in col. 9, lines 34-67.

However it is noted that Baldwin fails to disclose an interpolation engine. Baldwin's said geometry engine functions to perform said data manipulations and further discloses in col. 4, lines 10-12, a DDA (digital differential analyzer) which is used to produce linear gradation of color or other values. It would have been obvious to one of ordinary skill in the art at the time of the invention that said DDA, which Baldwin discloses as functioning in the geometry engine, col. 4, lines 5-35, produces linear gradation or other data manipulations, and thus performs the functions of an interpolation engine.

With respect to dependent claim 16, ". . . channel value of the interior point is further dependent upon a distance E between the interior point and the first point . . . a distance F between the interior point and the second point." Baldwin discloses in col. 13, lines 20-29.

With respect to dependent claim 17, ". . . channel value of the first point is further dependent upon a distance A between the first point and the first end point of the first edge . . . distance B between the first point and the second end point of the first edge." Baldwin discloses in col. 32, lines 25-31.

With respect to dependent claim 18, ". . . second point is further dependent upon a distance C between the second point . . . and dependent upon a distance D between the second point . . ." Baldwin discloses in col. 33, lines 35-67.

Conclusion

11.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

6,115,050	Landau et al.	345/433	09/05/2000	04/08/1998
5,821,949	Deering	345/505	10/13/1998	07/01/1996
6,111,584	Murphy	345/430	08/29/2000	06/04/1996

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Motilewa A. Good-Johnson whose telephone number is (703) 305-3939. The examiner can normally be reached on Monday - Friday 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on (703) 305-4713. The fax phone numbers for the organization where this application or proceeding is

assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.

Motilewa A. Good-Johnson
Examiner
Art Unit 2672

mgj
December 14, 2001

MICHAEL RAZAVI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600